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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: John W. Sherry
Title: SPEECH TO TEXT CAPTIONING FOR DIGITAL CAMERA
Attorney Docket No.: 884.166US1

PATENT APPLICATION TRANSMITTAL

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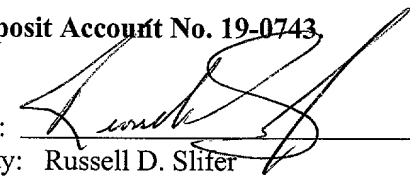
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UNITED STATES PATENT APPLICATION

SPEECH TO TEXT CAPTIONING DIGITAL CAMERA

INVENTOR

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654007-0011150

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Client Reference P7377

Speech to Text Captioning Digital Camera

Technical Field of the Invention

The present invention relates generally to digital cameras and in particular the present invention relates to captioning speech in a digital camera.

Background of the Invention

The field of photography has experienced significant advancements with the development of digital cameras. These cameras capture images and store the images as a digital file. Some cameras include features to allow for text to be superimposed on images. For example, a date or caption such as “1999 vacation” can be entered and superimposed on pictures. This text is typically used for several pictures and changes are relatively difficult.

In a similar manner, some cameras include a feature to capture speech. The speech is stored as a separate audio file from the image file. The two files are usually named in a similar manner (different extension), such as 0021.jpg and 0021.mpa for respective image and speech files for picture 0021. Playback of the audio file is awkward on a device other than the camera.

For the reasons stated above, and for other reasons stated below which will become apparent to those skilled in the art upon reading and understanding the present specification, there is a need in the art for a camera which allows for custom picture annotation using an audio input.

Summary of the Invention

In one embodiment, a camera comprises a photo-sensitive array for capturing an image, a microphone, a memory, and a processor coupled to the photo-sensitive array, microphone and memory. The processor converts audio input provided by the microphone into text and stores the text in the memory.

In another embodiment, a camera comprises a photo-sensitive array for capturing an image, a microphone, a memory, and a processor coupled to the photo-sensitive array, microphone and memory. The processor converts captured audio input provided by the microphone into a digital text file and converts the captured image into a digital image file. The processor also stores the digital image file and the digital text file as a single composite digital data file in the memory.

A method of operating a camera is provided which comprises activating a shutter of the camera to capture a light image, and converting the light image to digital image data. The method also includes activating an audio input, capturing audio input, and converting the audio input into text data.

Brief Description of the Drawings

Figure 1 is a block diagram of a camera according to one embodiment of the present invention;

Figure 2 is an example photograph including a text message;

Figure 3 is a flow chart of an example operation of the camera of Figure 1; and

Figure 4 illustrates an alternate embodiment of a camera system of the present invention.

Detailed Description of the Invention

In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the inventions may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical and electrical changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the claims.

Figure 1 illustrates a digital camera 100 according to one embodiment of the present invention. The camera includes an input lens 102 (including a shutter) for directing light to a light sensitive array 104. In operation the shutter is activated to direct a light image onto the array. This array can be any photosensitive array, such as a charge coupled device (CCD). CCDs have dominated vision applications because of their superior dynamic range, low fixed-pattern noise and high sensitivity to light. The array is coupled to a processor 106. The processor can transfer the image captured in the array to memory 110. Numerous images stored in the memory can be output through output circuitry 112. A microphone 108 is coupled to the processor for capturing speech, as explained below. The processor can process the speech and then route the speech to the memory for storage. The term processor as used herein encompasses circuitry required to convert the light image to digital data. Further, the processor can include any control circuitry needed to operate the camera, including output operations.

In operation, a user of the digital camera can activate a speech capturing operation using control 114. In one embodiment, control 114 comprises a switch which can be activated when speech is desired. Other types of control circuitry are contemplated, including speech recognition using the microphone and processor. In this embodiment, a pre-determined audio command is used to "wake-up" the camera speech capture mode. When the processor is in the speech capture mode, output speech signals provided by the microphone are converted to text using the processor. As such, the processor operates a speech translation operation. This operation is performed by executing a set of instructions which instruct the processor to convert the received speech. The text is then used to add captions to the photograph which was taken most recently.

Referring to Figure 2, a sample photograph is provided. The photograph includes a text message which describes the photograph as "sunset in the mountains during vacation of 1999". This text message is intended to illustrate the flexibility of the present invention to customize text on each photograph. The processor 106 can store the text message as either a separate text file (text data), or combine the

photograph data (digital image) and the text data as one digital file. As separate files, the speech can be stored as an audio file, or converted to text. By combining the files, unwanted separation of the photo and text can be avoided. Further, the text can be separately stored in parallel to the photo/text file to provide a level of redundancy.

5 Figure 3 provides an illustration of the operation of the digital camera. A user takes a photograph at 200 by activating the shutter. The photograph image is stored at 202. The user initiates audio speech input at 204, and the speech is converted to text at 206. Alternatively, a compresses audio file is stored of the speech at 208. The text is combined with the image at 210 to provide a common file which is stored in memory.
10 Alternately, the text is stored as a separate file at 212.

Figure 4 illustrates a camera system of the present invention. The system includes a digital camera 300 and an external processor 310. The camera is substantially similar to the camera of Figure 1 except the speech to text processor is external to the camera. The camera includes a microphone to capture speech. The
15 speech and digital image are communicated to the external processor as separate files. The processor converts the speech to text, as explained above, and combines the image and text into a single data file. This common file can be stored by the processor. This system can provide the benefits explained above without the physical limitations of a portable camera. As such, the system is better suited to a studio setting. Again, this
20 process allows for the combination of text and image into a common file.

Conclusion

A digital camera has been described which includes a processor and a microphone. The camera captures audio speech and converts the speech to text. The
25 text can be combined with a captured image to provide a composite file. The processor has been described as executing an instruction set which preforms the audio to text conversion.

Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is
30 calculated to achieve the same purpose may be substituted for the specific embodiment

shown. This application is intended to cover any adaptations or variations of the present invention. Therefore, it is manifestly intended that this invention be limited only by the claims and the equivalents thereof.

664037-0047463

What is claimed is:

- 1 1. A camera comprising:
2 a photo-sensitive array for capturing an image;
3 a microphone;
4 a memory; and
5 a processor coupled to the photo-sensitive array, microphone and memory, the
6 processor converts audio input provided by the microphone into text and stores the text
7 in the memory.
- 1 2. The camera of claim 1 wherein the photo-sensitive array comprises a charge
2 coupled device.
- 1 3. The camera of claim 1 wherein the processor stores the captured image as a
2 digital data file in the memory.
- 1 4. The camera of claim 1 wherein the processor stores the captured image and the
2 text as a single digital data file in the memory.
- 1 5. The camera of claim 1 further comprising an input control for activating the
2 processor to capture audio input provided via the microphone.
- 1 6. The camera of claim 5 wherein the input control is a switch.
- 1 7. The camera of claim 5 wherein the input control is an audio command provided
2 via the microphone to the processor.

1 8. A camera comprising:
2 a photo-sensitive array for capturing an image;
3 a microphone;
4 a memory; and
5 a processor coupled to the photo-sensitive array, microphone and memory, the
6 processor converts captured audio input provided by the microphone into a digital text
7 file and converts the captured image into a digital image file, and wherein the processor
8 stores the digital image file and the digital text file as a single composite digital data file
9 in the memory.

1 9. The camera of claim 8 further comprising an input control for activating the
2 processor to capture audio input provided via the microphone.

1 10. The camera of claim 9 wherein the input control is an audio command provided
2 via the microphone to the processor.

1 11. The camera of claim 8 wherein the processor further stores the captured audio as
2 a separate audio file in the memory.

1 12. A method of operating a camera comprising:
2 activating a shutter of the camera to capture a light image;
3 converting the light image to digital image data;
4 activating an audio input;
5 capturing audio input; and
6 converting the audio input into text data.

1 13. The method of claim 12 further comprising storing the digital image data and the
2 text data in a memory of the camera.

- 1 14. The method of claim 13 wherein the digital image data and the text data are
2 stored in the memory of the camera as a composite digital file.
- 1 15. A method of operating a camera comprising:
2 activating a shutter of the camera to capture a light image using a photosensitive
3 array;
4 converting the light image to digital image data;
5 activating an audio input;
6 capturing audio input;
7 converting the audio input into text data; and
8 storing the text data and the digital image data as a single digital data file in a
9 memory of the camera.
- 1 16. A camera system comprising:
2 camera having a photo-sensitive array for capturing an image, a microphone, and
3 a memory; and
4 an external processor coupled to the camera, the processor converts audio input
5 provided by the camera into text and combines the text and the image provided by the
6 camera into a common data file.
- 1 17. The camera system of claim 16 further comprising an input control for activating
2 the external processor to capture audio input provided via the microphone.
- 1 18. The camera system of claim 17 wherein the input control is a switch.
- 1 19. The camera system of claim 17 wherein the input control is an audio command
2 provided via the microphone to the processor.

- 1 20. A method of operating a camera system comprising:
2 activating a shutter of the camera to capture a light image using a photosensitive
3 array;
4 converting the light image to digital image data;
5 activating an audio input;
6 capturing audio input;
7 converting the audio input into text data using an external processor; and
8 storing the text data and the digital image data as a single digital data file.

Abstract of the Disclosure

A digital camera includes a processor and a microphone. The camera captures audio speech and converts the speech to text. The text can be combined with a captured image to provide a composite file. The processor executes an instruction set which preforms the audio to text conversion. Text conversion is activated using either a user
5 activated input control, or through voice commands.

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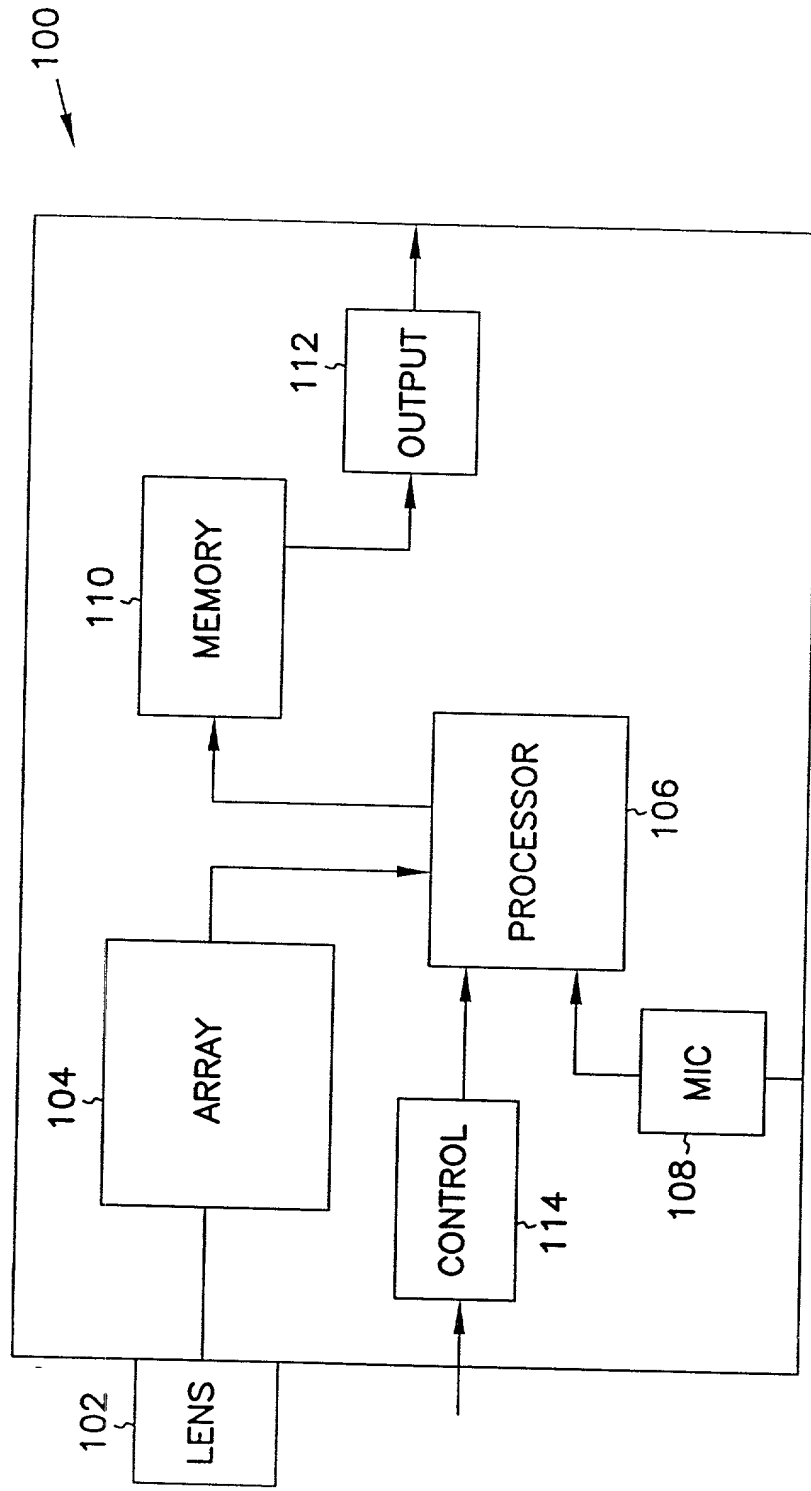


FIG 1

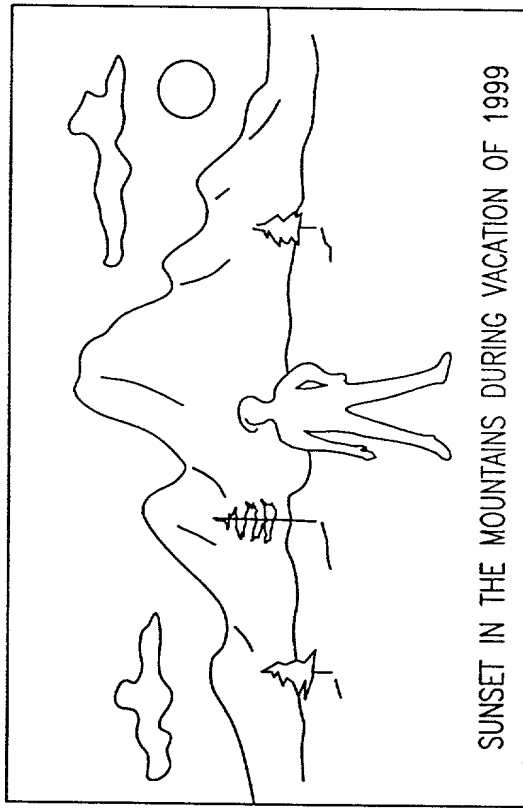


FIG. 2

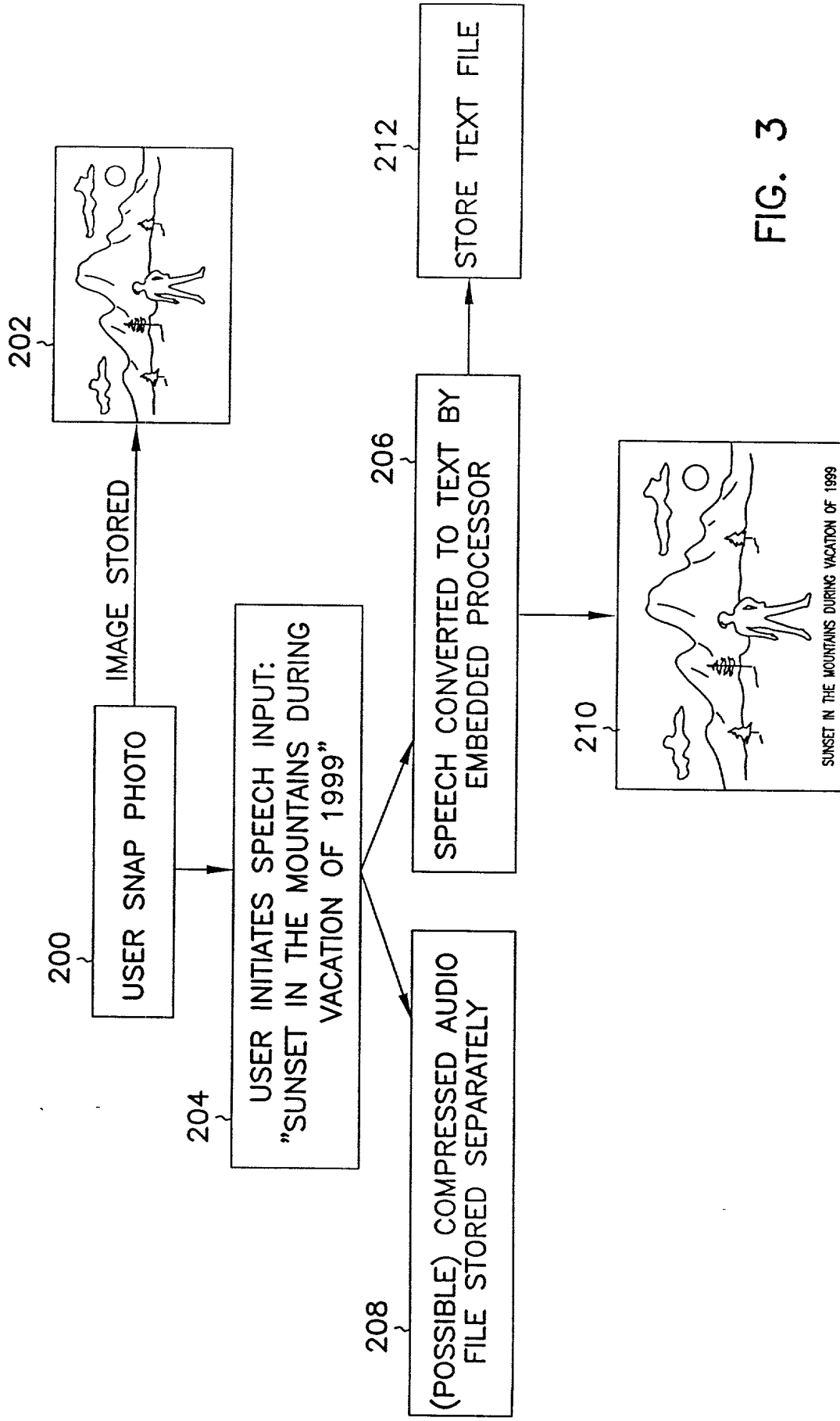


FIG. 3

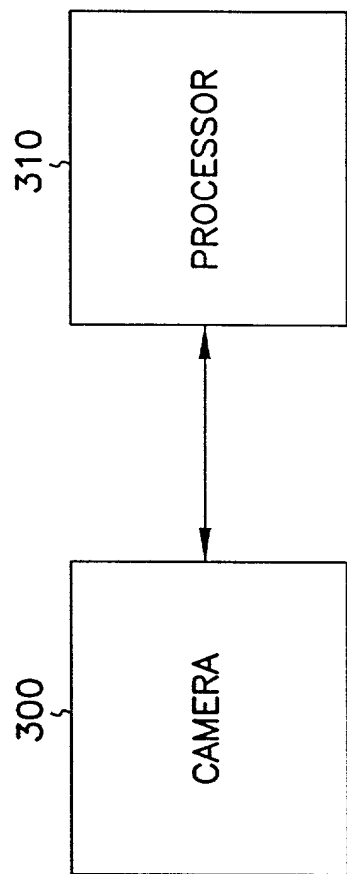


FIG. 4

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **SPEECH TO TEXT CAPTIONING FOR DIGITAL CAMERA.**

The specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 C.F.R. § 1.56 (attached hereto). I also acknowledge my duty to disclose all information known to be material to patentability which became available between a filing date of a prior application and the national or PCT international filing date in the event this is a Continuation-In-Part application in accordance with 37 C.F.R. § 1.63(e).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 120 or 365(c) of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

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I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

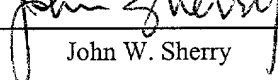
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Adams, Matthew W.	Reg. No. 43,459	Harris, Robert J.	Reg. No. 37,346	Nelson, Albin J.	Reg. No. 28,650
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Fogg, David N.	Reg. No. 35,138	Mates, Robert E.	Reg. No. 35,271	Woessner, Warren D.	Reg. No. 30,440
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Telephone No. (612)373-6900

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Full Name of sole inventor : **John W. Sherry**
Citizenship: **United States of America** Residence: **Portland, OR**
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Signature:  Date: 10/1/99
John W. Sherry

Full Name of inventor:
Citizenship:
Post Office Address:
Residence:

Signature: _____ Date: _____

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(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

- (1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or
- (2) It refutes, or is inconsistent with, a position the applicant takes in:
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A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

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- (2) Each attorney or agent who prepares or prosecutes the application; and
- (3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

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